

IN THE CLAIMS

A listing of the claims of the present application is as follows:

1. through 33. (Canceled).
34. (New) An array of photodiodes extending in two dimensions and comprising:
a plurality of anodes formed at first surfaces of a corresponding plurality of substrates;
a corresponding plurality of cathodes formed at second surfaces of the plurality of substrates;
an electrical interconnection between the plurality of anodes; and
a connector interface provided with a corresponding plurality of contacts electrically connected to the respective cathodes for reading output signals provided by the plurality of cathodes.
35. (New) An array according to claim 34, wherein the plurality of substrates are formed by dividing a single substrate.
36. (New) An array according to claim 34, wherein a passivation layer connects the plurality of substrates.
37. (New) An array according to claim 34, wherein the plurality of cathodes comprise a plurality of conductive layers formed at the surface of the substrate.
38. (New) An array according to claim 37, wherein there is further provided a metal layer on each conductive layer.
39. (New) An array according to claim 34, wherein the plurality of anodes comprise a plurality of active regions formed at the first surface.

40. (New) An array according to claim 39, wherein there is further provided a metal contact for each active region.

41. (New) An array according to claim 34, wherein the electrical interconnection is provided by one of: wire bonding, metal contacts, or a conductive sheet.

42. (New) An array according to claim 34, wherein the plurality of substrates is formed on the connector interface.

43. (New) An array according to claim 34, wherein the plurality of contacts are connected to the plurality of cathodes by an epoxy.

44. (New) An imaging system including an array of photodiodes and a connector interface, the array of photodiodes extending in two dimensions and comprising:
a plurality of anodes formed at first surfaces of a corresponding plurality of substrates;
a corresponding plurality of cathodes formed at second surfaces of the plurality of substrates; and
an electrical interconnection between the plurality of anodes;
wherein the connector interface is provided with a corresponding plurality of contacts electrically connected to the respective cathodes for reading output signals provided by the plurality of cathodes.

45. (New) A computed tomography imaging system including an array of photodiodes and a connector interface, the array of photodiodes extending in two dimensions and comprising:
a plurality of anodes formed at first surfaces of a corresponding plurality of substrates;
a corresponding plurality of cathodes formed at second surfaces of the plurality of substrates; and
an electrical interconnection between the plurality of anodes;
wherein the connector interface is provided with a corresponding plurality of contacts electrically connected to the respective cathodes for reading output signals provided by the plurality of cathodes.

46. (New) A photo-detector array including a plurality of sub-arrays of photo-diodes, each sub-array of photodiodes extending in two dimensions and comprising:

- a plurality of anodes formed at first surfaces of a corresponding plurality of substrates;
- a corresponding plurality of cathodes formed at second surfaces of the plurality of substrates;
- an electrical interconnection between the plurality of anodes; and
- a connector interface provided with a corresponding plurality of contacts electrically connected to the respective cathodes for reading output signals provided by the plurality of cathodes;

wherein the plurality of said sub-arrays of photo-diodes are placed adjacent to each other in a matrix to form the photo-detector array.

47. (New) A photo-detector array according to claim 46 wherein the matrix extends in two directions.

48. (New) An imaging system comprising:

- a radiation detector having a photo detector array including a plurality of sub-arrays of photo-diodes placed adjacent to each other in a matrix to form the photo-detector array;
- a radiation source facing the radiation detector; and
- means for controlling the radiation detector and the radiation source;

wherein each sub-array of photodiodes extends in two dimensions and includes:

- a plurality of anodes formed at first surfaces of a corresponding plurality of substrates;
- a corresponding plurality of cathodes formed at second surfaces of the plurality of substrates;
- an electrical interconnection between the plurality of anodes; and
- a connector interface provided with a corresponding plurality of contacts electrically connected to the respective cathodes for reading output signals provided by the plurality of cathodes.

49. (New) An imaging system according to claim 48, wherein the radiation source is an X-ray tube equipped with a high-voltage generator.

50. (New) An imaging system according to claim 48, wherein the radiation detector and the radiation source are radially mounted in a cylindrical scanning structure.

51. (New) An imaging system according to claim 48, wherein the means for controlling comprises a computer system.

52. (New) A method of forming an array of photodiodes extending in two directions, comprising:
forming a plurality of anodes at a first surface of a substrate;
forming a corresponding plurality of cathodes at a second surface of the substrate;
dividing the substrate into a corresponding plurality of substrates; electrically interconnecting the plurality of anodes;
providing a connector interface comprising a corresponding plurality of contacts; and
electrically connecting the plurality of contacts to the respective cathodes, wherein the plurality of cathodes provide the plurality of output signals of the array.

53. (New) A method according to claim 52, wherein the step of forming a plurality of cathodes comprises providing a plurality of conductive layers on the second surfaces of the plurality of substrates.

54. (New) A method according to claim 53, wherein the plurality of conductive layers are formed by providing a continuous conductive layer on the second surface of the single substrate, and electrically isolating portions of the continuous layer to form the plurality of conductive layers.

55. (New) A method according to claim 54, wherein the portions of the conductive layer are electrically isolated by etching or cutting the continuous conductive layer.

56. (New) A method according to claim 55, wherein the step of etching or cutting further etches the substrate.

57. (New) A method according to claim 56, wherein the substrate is etched or cut completely.
58. (New) A method according to claim 56, wherein a passivation layer on the first surface of the substrate is unaffected by the etch or cut.
59. (New) A method according to claim 57 wherein there is thus formed a plurality of isolated substrate portions.
60. (New) A method according to claim 55, wherein the etch or cut is patterned such that a contiguous area is etched or cut around each cathode.
61. (New) A method according to claim 52, wherein the step of interconnecting the plurality of anodes includes providing between the plurality of anodes one of: wire bonding, a metal interconnect, or a conductive sheet over the first surfaces.
62. (New) A method according to claim 52, wherein the connector interface comprises one of: a plurality of pads for connection to the plurality of cathodes, a substrate, or an integrated circuit.
63. (New) A method of forming an array of photodiodes extending in two directions, comprising:
forming a plurality of anodes at first surfaces of a corresponding plurality of substrates;
forming a corresponding plurality of cathodes at second surfaces of the plurality of substrates;
electrically interconnecting the plurality of anodes;
providing a connector interface comprising a corresponding plurality of contacts; and
electrically connecting the plurality of contacts to the respective cathodes, wherein the plurality of cathodes provide the plurality of output signals of the array.

64. (New) A method according to claim 63, wherein the step of interconnecting the plurality of anodes includes providing between the plurality of anodes one of: wire bonding, a metal interconnect, or a conductive sheet over the first surfaces.

65. (New) A method according to claim 64, wherein the connector interface comprises one of: a plurality of pads for connection to the plurality of cathodes, a substrate, or an integrated circuit.

66. (New) A semiconductor packaging structure comprising an array of photo-diodes and a connector interface, the array of photo-diodes extending in two dimensions and including:
a plurality of anodes formed at first surfaces of a corresponding plurality of substrates;
a corresponding plurality of cathodes formed at second surfaces of the plurality of substrates; and
an electrical interconnection between the plurality of anodes;
wherein the connector interface is provided with a corresponding plurality of contacts electrically connected to the respective cathodes for reading output signals provided by the plurality of cathodes.

67. (New) A radiation detector comprising at least one array of photodiodes, at least one of said at least one array of photo-diodes extending in two dimensions and including:
a plurality of anodes formed at first surfaces of a corresponding plurality of substrates;
a corresponding plurality of cathodes formed at second surfaces of the plurality of substrates;
an electrical interconnection between the plurality of anodes; and
a connector interface provided with a corresponding plurality of contacts electrically connected to the respective cathodes for reading output signals provided by the plurality of cathodes.